Claims:

1. A bi-phase modulator for an ultra wideband signal, comprising:

a symmetrical transformation device that receives an input UWB waveform and converts the energy of the input waveform into the energy of a first waveform and a second waveform, wherein the first waveform and second waveform are substantially identical waveforms of opposite polarity; and

a selector device that presents one of the first waveform and second waveform at the output of the bi-phase modulator in response to the state of an information signal and concurrently terminates the other one of the first waveform and second waveform.

2. A bi-phase modulator for an ultra wideband signal, comprising:

a first symmetrical transformation device that receives an input waveform and converts the energy of the input waveform into the energy of a first waveform and a second waveform, wherein the first waveform and output waveform are substantially identical waveforms of opposite polarity;

a second symmetrical transformation device that receives the first waveform and the second waveform and converts the energy of the first waveform and the second waveform into the energy of an output waveform; and

a selector device serving as a crossover switch between the first symmetrical transformation device and the second symmetrical transformation device which presents the first waveform and the second waveform via a direct connection state or and inverted connection state in response to the state of an information signal.

3. The bi-phase modulators of claims 1 and 2, wherein the symmetrical transformation device comprises balanced transmission lines serially coupled to unbalanced transmission lines.

4. The bi-phase modulator of claim 3, wherein the selector comprises a switch having a ground reference connection to one of a virtual ground and a physical ground associated with one of the balanced transmission lines and the unbalanced transmission lines.

5. The bi-phase modulator of claim 3, wherein at least one of the balanced transmission lines and unbalanced transmission lines has impedance tapers.

6. The bi-phase modulator of claim 1, wherein the symmetrical transformation device comprises a center tapped primary transformation device having a primary to secondary field coupling mechanism for selective waveform polarity conveyance to a differential device.

7. The bi-phase modulator of claim 6, wherein said differential device is a UWB antenna.

8. The bi-phase modulator of claim 1, wherein the symmetrical transformation device comprises a center tapped secondary transformation device having a primary to secondary field coupling mechanism for selective waveform polarity conveyance waveform coupling mechanism to a differential device.

9. The bi-phase modulator of claim 1, wherein the symmetrical transformation device comprises a center tapped primary transformation device having a primary to secondary field coupling mechanism for selective waveform polarity conveyance to a differential device.

10. The bi-phase modulator of claim 9, wherein said differential device is a UWB antenna.

11. The bi-phase modulator of claim 2, wherein at least one of the first symmetrical transformation device and the second symmetrical transformation device comprises a center tapped primary transformation device having a primary to secondary field coupling mechanism for selective waveform polarity conveyance to a differential device.

12. The bi-phase modulator of claim 11, wherein said differential device is a UWB antenna. .

13. The bi-phase modulator of claim 2, wherein at least one of the first symmetrical transformation device and the second symmetrical transformation device comprises a center tapped secondary transformation device having a primary to secondary field coupling mechanism for selective waveform polarity conveyance waveform coupling mechanism to a differential device.

13. The bi-phase modulator of claim 13, wherein said differential device is a UWB antenna.

14. The bi-phase modulator of claims 1 and 2, wherein the information signal comprises at least one of a data signal and a channel signal.

16. The bi-phase modulator of claim 13, wherein the channel signal is in accordance with a time hopping code.

17. A bi-phase modulator for an ultra wideband (UWB) signal, comprising:
a symmetrical transformation device that receives an input UWB waveform and converts the energy of the input UWB waveform into the energy of a first output UWB waveform and a second output UWB waveform, wherein the first output UWB waveform and second output UWB waveform are substantially identical waveforms of opposite polarity; and

a selector that presents one of the first output UWB waveform and second output UWB waveform at the output of the bi-phase modulator in response to the state of an information signal.

18. The bi-phase modulator of claim 17, wherein the symmetrical transformation device comprises input transmission lines that are serially coupled to output transmission lines.

19. The bi-phase modulator of claim 18, wherein the output transmission lines have a common node.

20. The bi-phase modulator of claim 19, wherein the selector comprises a switch that is grounded by the common node.

21. The bi-phase modulator of claim 18, wherein at least one of the input transmission lines and output transmission lines comprise at least one of coupled lines, coaxial lines, slotlines, microstrips, and striplines.

22. The bi-phase modulator of claim 18, wherein the input and output transmission lines are tapered transmission lines.

23. The bi-phase modulator of claim 18, wherein the selector comprises a crossover switch that serially couples the input transmission lines to the output transmission lines, said crossover switch being responsive to the state of the information signal for presenting one of the first output UWB waveform and second output UWB waveform at the output of the bi-phase modulator.

24. The bi-phase modulator of claim 17, wherein the symmetrical transformation device divides the energy of the input waveform into energies of the first output UWB waveform and second output UWB waveform.

25. The bi-phase modulator of claim 17, wherein the symmetrical transformation device converts the energy of the input waveform into the energy directly into the first output UWB waveform or inversely into the second output UWB waveform based on the state of the information signal.

26. The bi-phase modulator of claim 25, wherein the symmetrical transformation device uses a crossover switching arrangement for direct or inverse transformation of the energy of the input waveform into the energy of one of the first output UWB waveform and second output UWB waveform.

27. The bi-phase modulator of claim 17, wherein the symmetric transformation device comprises a center tapped transformation device having a primary coupling mechanism for receiving the input UWB waveform and a secondary coupling mechanism coupled to a differential UWB antenna.

28. The bi-phase modulator of claim 17, wherein the symmetric transformer comprises a center tapped transformation device having a secondary coupling mechanism for receiving the input UWB waveform and a primary coupling mechanism coupled to a differential UWB antenna.

29. The bi-phase modulator of claim 17, wherein the information signal comprises at least one of a data signal and a channel signal.

30. The bi-phase modulator of claim 29, wherein the channel signal is in accordance with a time hopping code.

31. A symmetrical transformation device, comprising:

a first input transmission line having an unbalanced input for receiving an input UWB waveform;

a second transmission line, said second transmission line being balanced and being coupled to said first transmission line; and

a third transmission line, said third transmission line having a first unbalanced output and a second unbalanced output and being coupled to said second transmission line;

wherein a first output UWB waveform is output the first unbalanced output and a second output UWB waveform is output the second unbalanced output, wherein said first output UWB waveform and said second output UWB waveform are substantially identical but have opposite polarity.

32. A bi-phase modulator for an ultra wideband signal, comprising:

a symmetrical transformation device that receives an input UWB waveform and converts the energy of the input waveform into the energy of a first output waveform and a second output waveform, wherein the first output waveform and second output waveform are substantially identical waveforms of opposite polarity; and

a selector device that determines based on an information signal which one of the first output waveform and second output waveform are presented at the output of the bi-phase modulator.